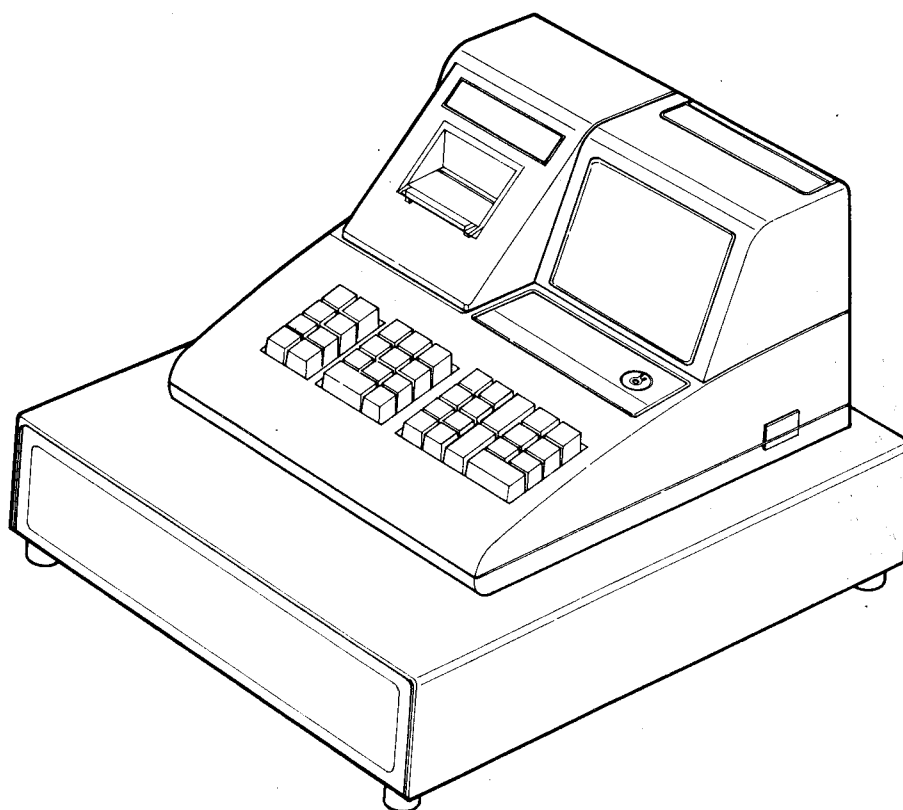




SERVICE MANUAL

ER-220/ER-240

ELECTRONIC CASH REGISTER



SPECIFICATION

| ITEM | SPECIFICATION | ITEM | SPECIFICATION |
|---------|-----------------------------|--------|---------------------------|
| POWER | AC 120, 220, 240/50Hz, 60Hz | DRAWER | 4B/8C,5B/5C,3B/4C,4B/4C |
| RATING | 16 WATT | MODE | VOID, OFF, REG, X, Z, PGM |
| PRINTER | CP121CRS | | |
| DISPLAY | FRONT(9), REAR(9) | | |

Design and specifications are subject to change without notice.

=====

W A R N I N G

=====

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause interference to radio communications.

It has been tested and found to comply with the limits for a Class A computing device, pursuant to subpart J of part 15 of FCC Rules, which a redesigned to provide reasonable protection against such interference when operated in a commercial environment.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

=====

S Y S T E M O V E R V I E W

=====

This ELECTRONIC CASH REGISTER is the microprocessor based system, using an 8 - bit single chip microcomputer.

This service manual provides technical information for many individual component systems, and circuit, and gives an analysis of the operations performed by the circuits. The Keyboard, power supply, display and printer circuit, and the other circuitry are covered.

Also included is technical information on the CITIZEN single station printer used in this machine. If you need more technical service, please call our service branch.

Schematics and specifications provide needed information for the accurate trouble-shooting.

All information in this manual is subject to change without prior notice. Therefore you must check the correspondence of your manual with your machine.

No part of this manual may be copied or reproduced in any form or by any means without the prior written consent of ours.

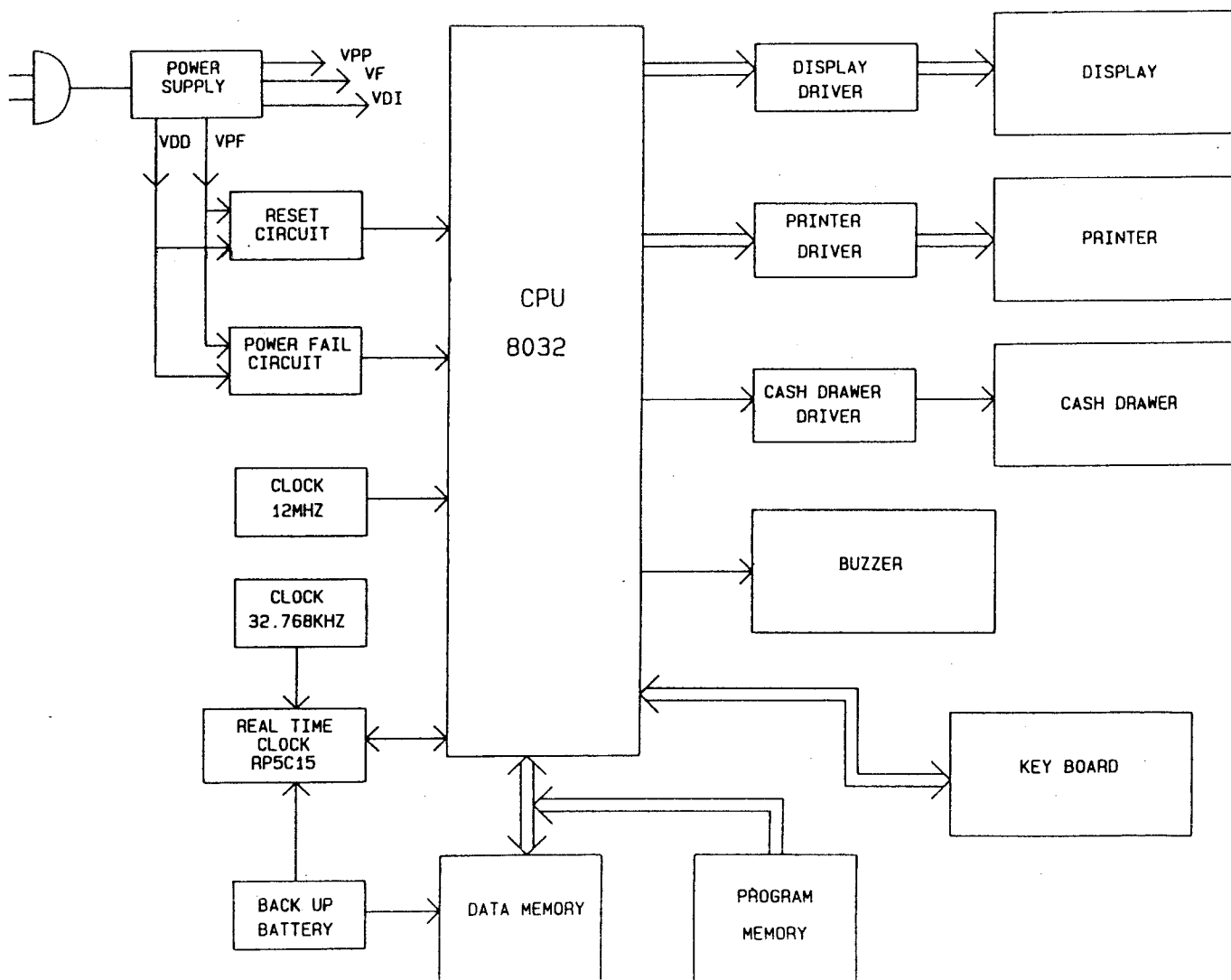
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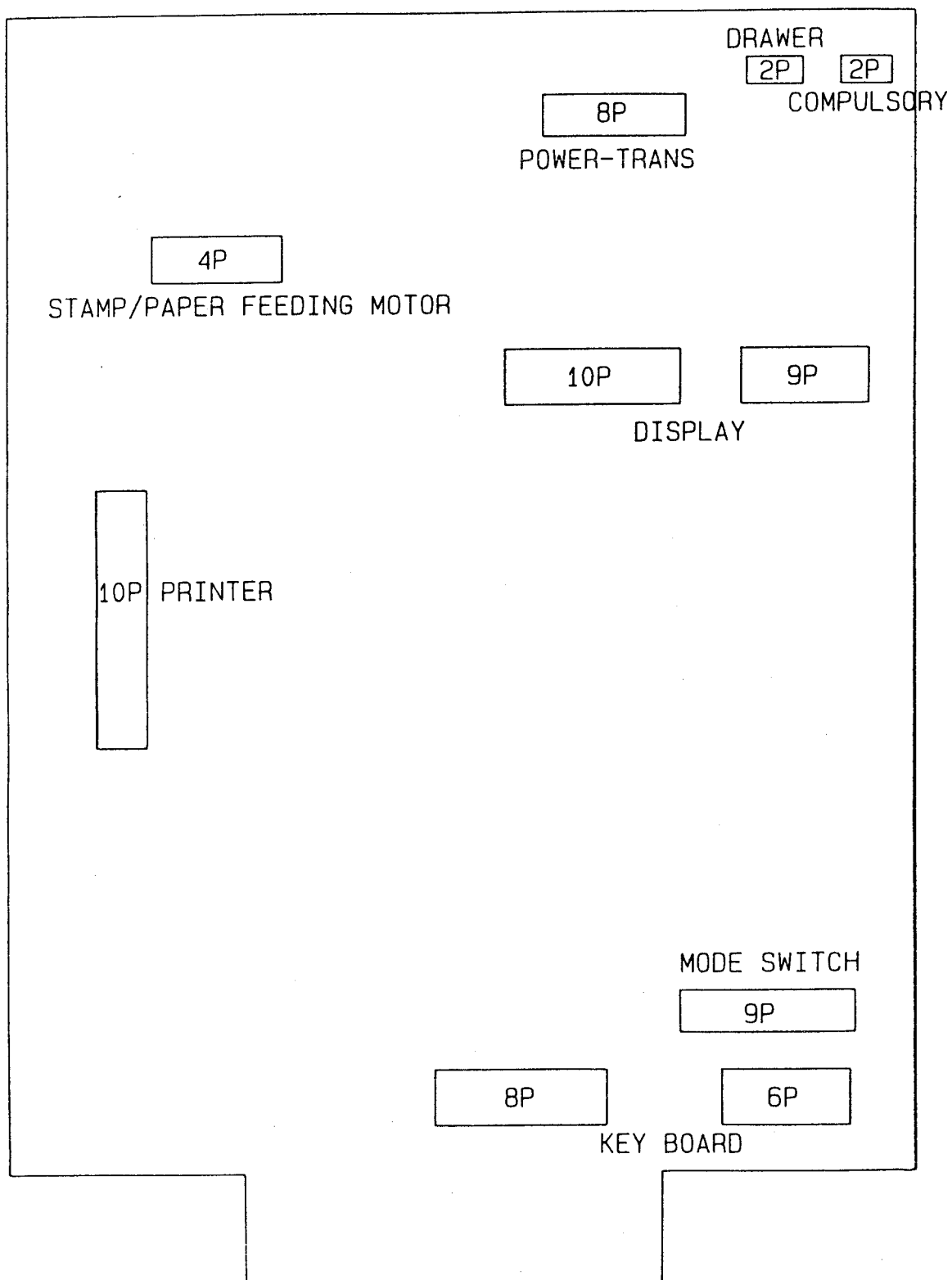
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1 . SYSTEM BLOCK DIAGRAM



2 . D I S A S S E M B L Y M A I N - P W B



3 . SYSTEM I N S T A L L A T I O N

3-1 BATTERY ON/OFF SWITCH

Look at the MAIN PWB, you can find a small JUMPERED SWITCH at the BATTERY side. The purpose of this switch is to minimize the consumption of battery power when this machine is not used for a long time.

For the normal operation, this switch must be placed at the ON position.

WARNING : If you turn OFF this switch while using the set, it changes the time and values that are preset.

3-2 SYSTEM RESET PROCEDURE

When install the machine, SYSTEM RESET must be performed before operation. Plug in, while depress [-%], [VD], [# / NS] keys in 3 seconds at PGM mode. Then, this system will be reset and all data will be cleared. (REFER TO USERS MANUAL)

WARNING : You should not do this procedure after installation.
If you do so, all counter and total sums be lost.

TRANSFORMER SPECIFICATION

=====

1

PRI.

2

FUSE2

FUSE1

3

4

5

6

7

8

9

10

| VER. | PRIMARY | SECONDARY | (COLOR) |
|--------|-----------|-------------------|---------|
| U.S.A | 120V 60Hz | (3-4) AC18V 1.4A | RED |
| EUROPE | 220V 50Hz | (5-6) AC9.5V 0.7A | BLUE |
| U.K. | 240V 50Hz | (7-8) AC22V 0.1A | ORANGE |
| | | (9-10) AC4V 0.15A | WHITE |

FUSE SPECIFICATION (SECONDARY)

=====

| LOC. NO | EUROPE CODE NO. | | U.S.A CODE NO. | |
|---------|-----------------|----------------|----------------|----------------|
| FUSE1 | 250V F1A | 949 115003FHNA | 125V NM1A | 949 115101NLNA |
| FUSE2 | 250V T2A | 949 115009THNA | 125V SB2A | 949 115101SLNA |

4 . C I R C U I T R Y

4-1 POWER CIRCUIT

This machine has two different power sources, the one is a power circuit and the other is a BATTERY.

The power circuit generates five different DC voltage sources, +5V for the logic, +17V for the printer driving, +4V and -24V for the display and +11.2V for the power fail detection circuit.

The BATTERY applies +3.6V to the back-up circuit.

A. VPP(+17V)

The VPP voltage is used for the source voltage of the printer drive circuit. The AC 18V is rectified by the BRIDGE DIODE RECTIFIER BD1 and it is regulated by the capacitor 50V 2200uF.

The switching circuit composes circuit of 2 Transistors KSC945 and KSD288, a zener diode 18V, to maintain the output voltage at DC 17V.

B. VPF(+11.2V)

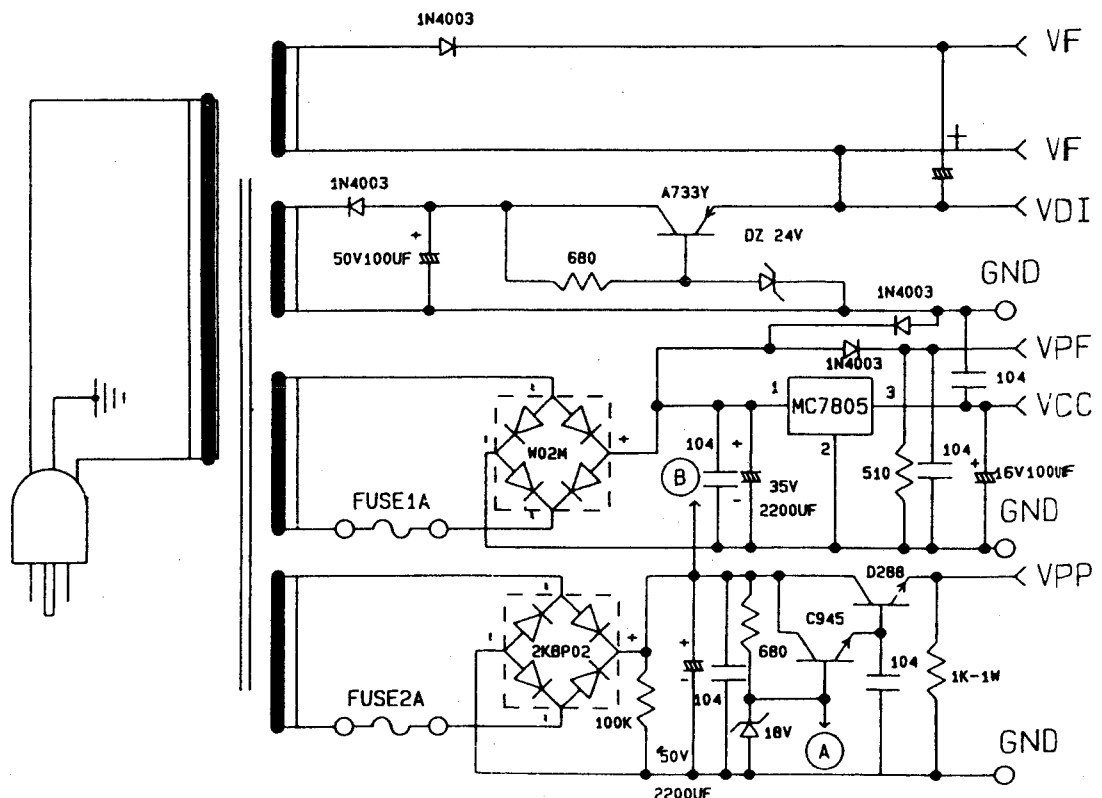
The VPF voltage is used for the input voltage of the power fail detection and reset circuit.

The AC9.5V is rectified by the BRIDGE DIODE RECTIFIER BD2 and regulated by the capacitor 35V 10uF. Then the output is +11.2V.

C. VCC(+5V)

The VCC is used for the power source of the system logic.

The most part of this voltage, rectified by the BD2 and passed through the diode 1N4003, is regulated by the capacitor 35V 2200uF, and it input the 3 - terminal regulating IC MC7805. Then output voltage is applied to directly to the logic and other +5V terminal.



D. VF(+4V)

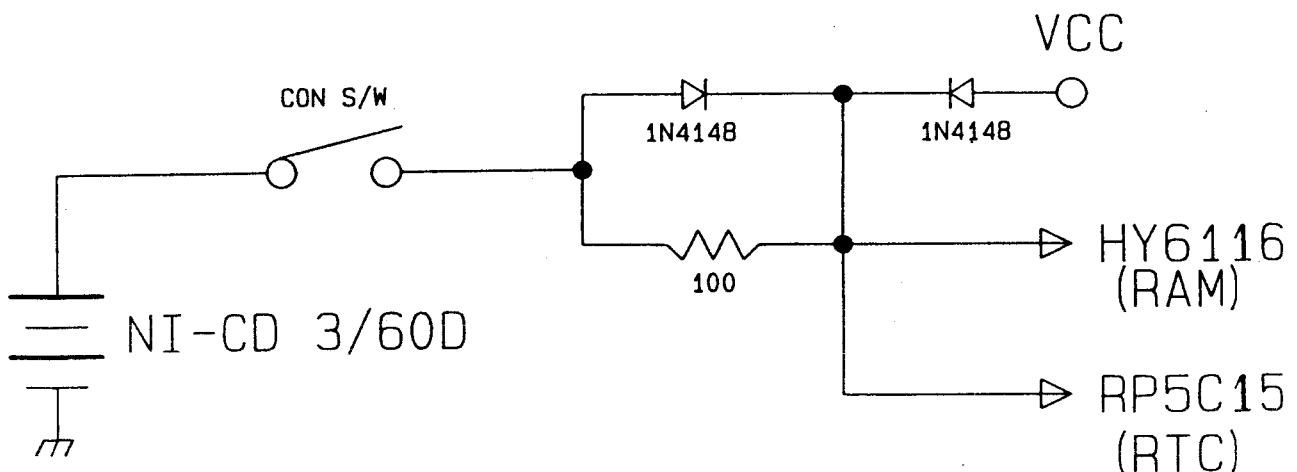
The VF voltage is used for providing the power to the filament of the DIGITRON. The AC 4V is rectified by the diode rectifier 1N4003 and regulated by the capacitor 16V 470uF. The 4V output voltage heats the filament of the DIGITRON.

E. VDI(-24V)

The VDI voltage is used for providing to the GRID and PLATE of DIGITRON. The AC 22V is rectified by the diode rectifier 1N4003 and then regulated by the capacitor 50V 100uF. The switching circuit composes of a zener diode 24V and a transistor KSA733, it maintains the output voltage at DC -24V.

4-2 BATTERY CIRCUIT

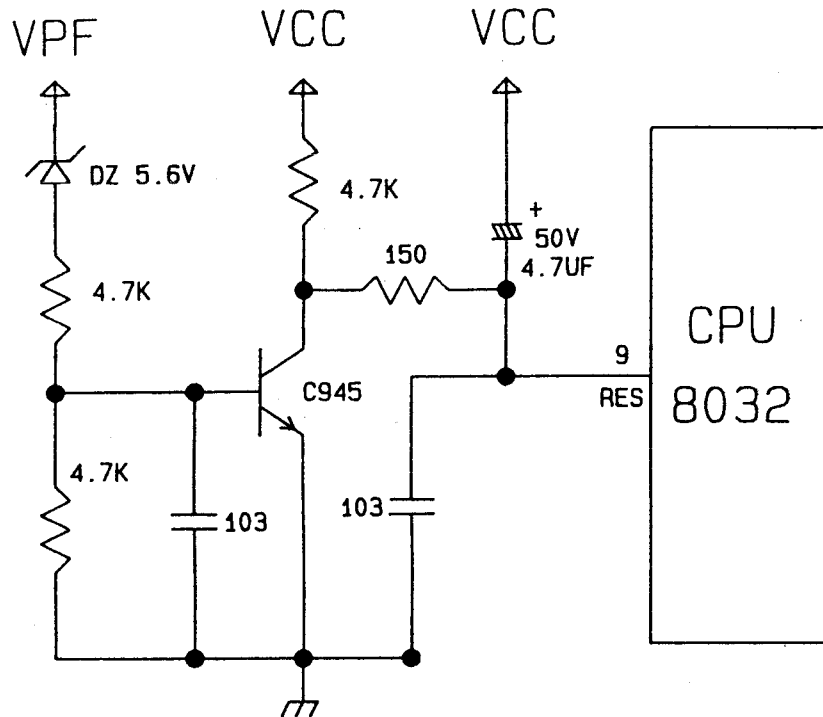
In the normal operation, VCC voltage goes to the BATTERY through D2, R for the charge. At the power off, BATTERY voltage goes to the RAM (HY6116) and RTC(RP5C15). This operation is able to keep saving the DATA for a long time without the external power source.



4-3 RESET AND POWER FAIL DETECTION CIRCUIT

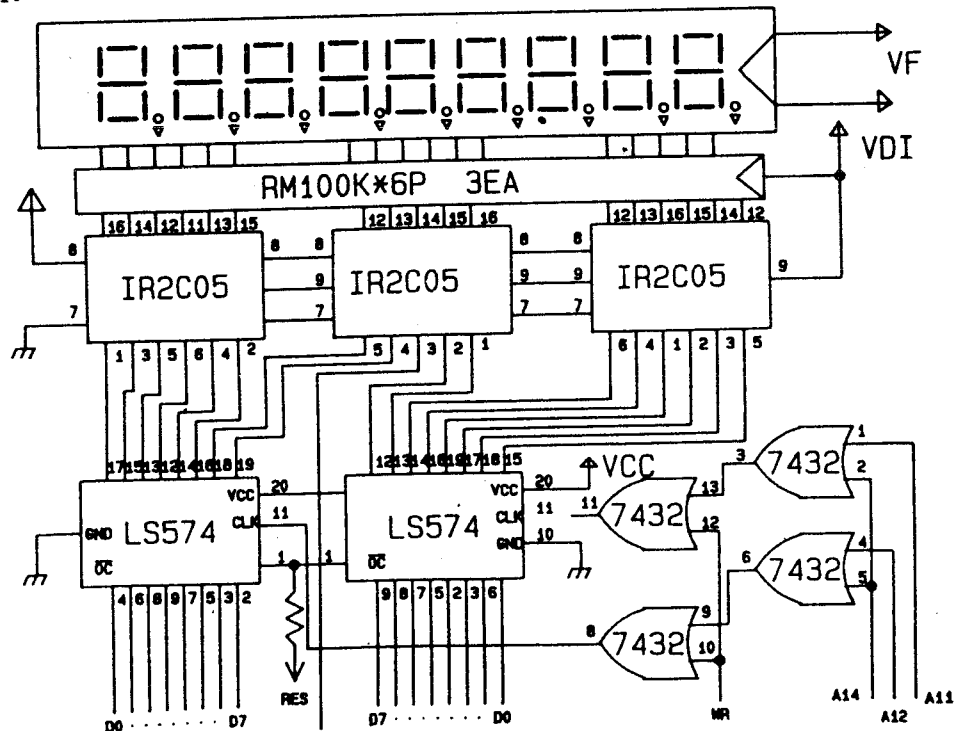
The reset circuit prevents the CPU from starting to operate before the system is fully powered-up and initialized.

The power fail detection circuit is to save the state of the CPU and it's meaningful data before the logic voltage of CPU goes down below the normal operation voltage on the condition such as main power off.



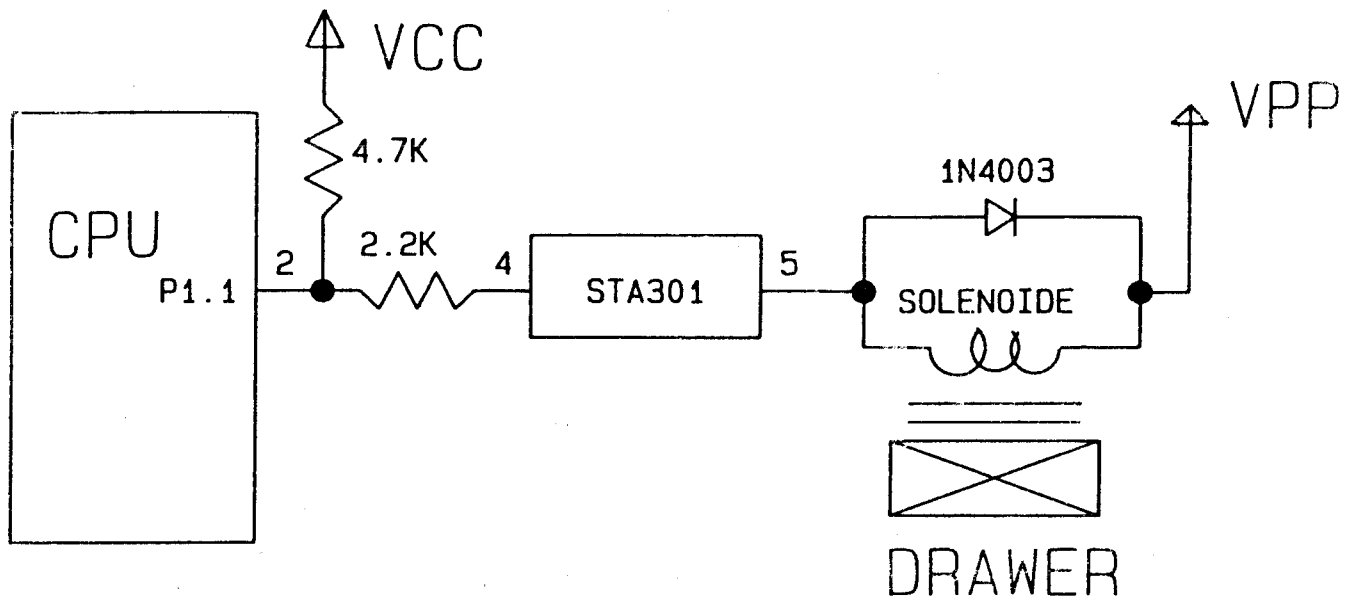
4-4 DISPLAY CIRCUIT

This circuit is composes display and turret(customer) for display to input Data by the KEYBOARD. Digit and segment sinal outputed D0 - D7 by CPU, it's output the Digitron by the amplituding IC IR2C05 through LATCH 74HCTLS574.



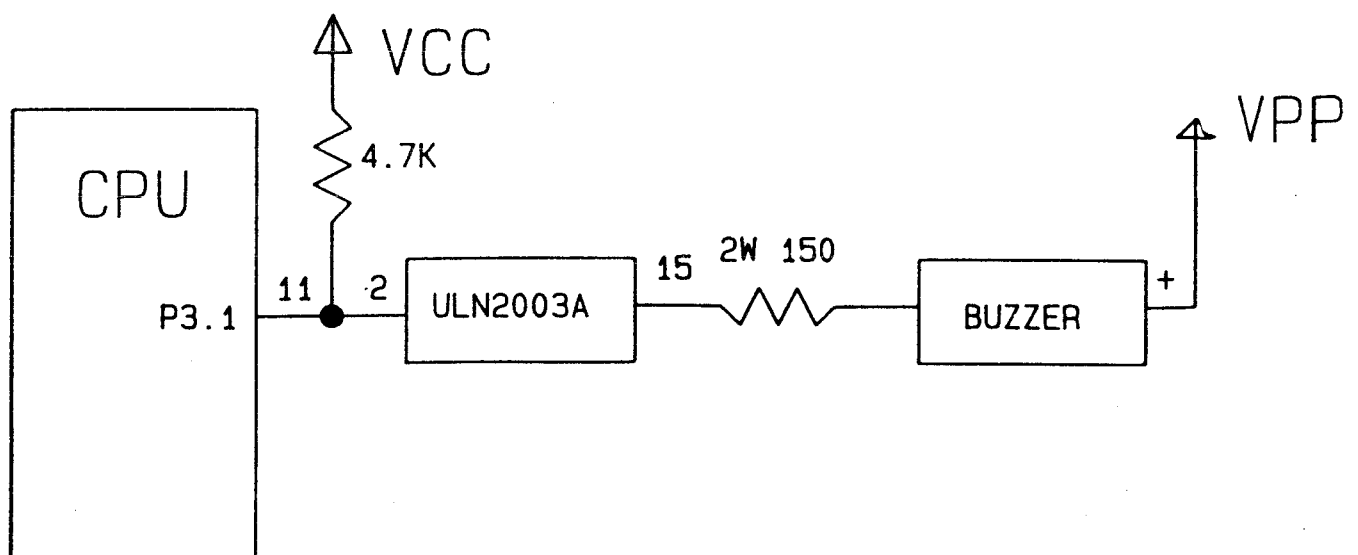
4-5 DRAWER CIRCUIT

The Drawer circuit is activated by using the signal P1.1 from the CPU. This signal is normally LOW, and goes HIGH to cause STA301 to turn ON and activate the drawer solenoid, then the Drawer is opened.



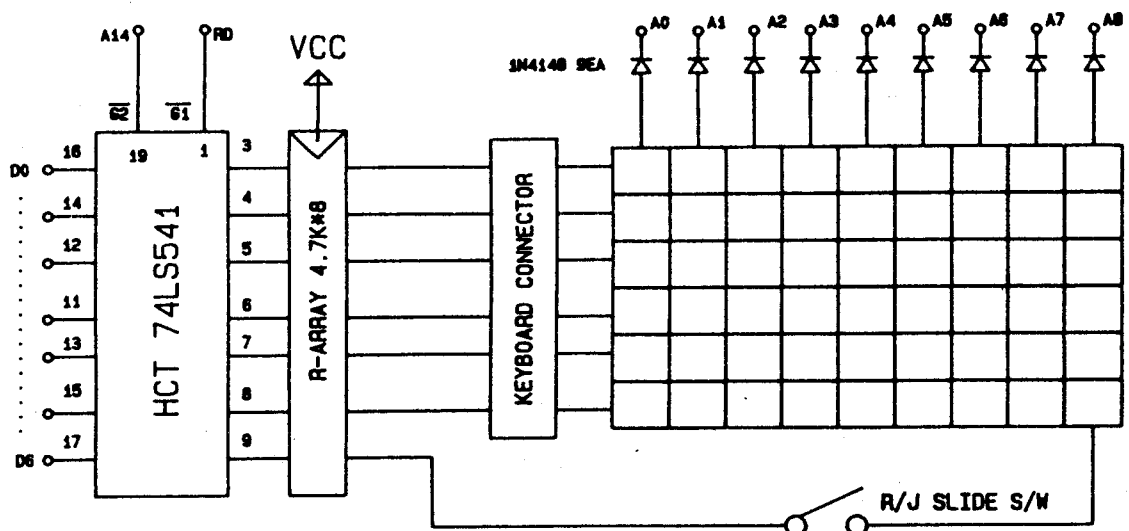
4-6 BUZZER CIRCUIT

The Buzzer is activated by the NORMAL INPUT of the key and ERROR state. This signal is normally LOW, and goes HIGH to turn on the ULN2003A and activates the BUZZER. In the case of the normal input of the key, it activates during about 50msec, in the case of ERROR state, it activates until stop operation such as CLEAR key input.



4-7 KEYBOARD CIRCUIT

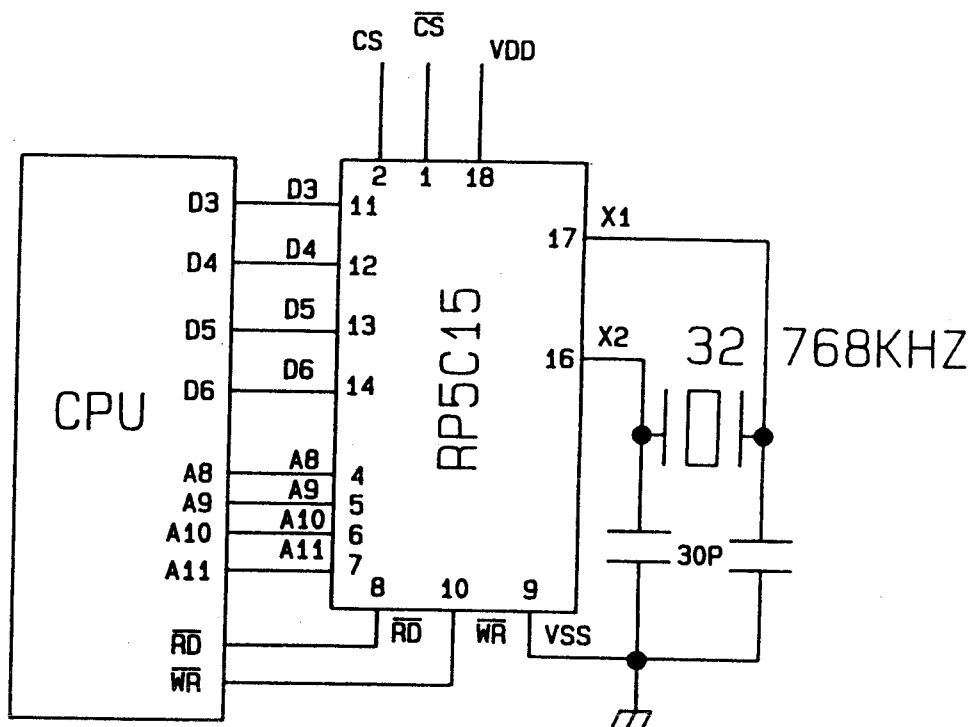
Key scan is completed by applying the scan signal on the address line and the return signal on the data line of CPU through key switch and 74HCTLS541.



4-8 REAL TIME CLOCK CIRCUIT

The clock circuit composes of a timer IC RP5C15, a crystal 32.768KHz and two capacitor.

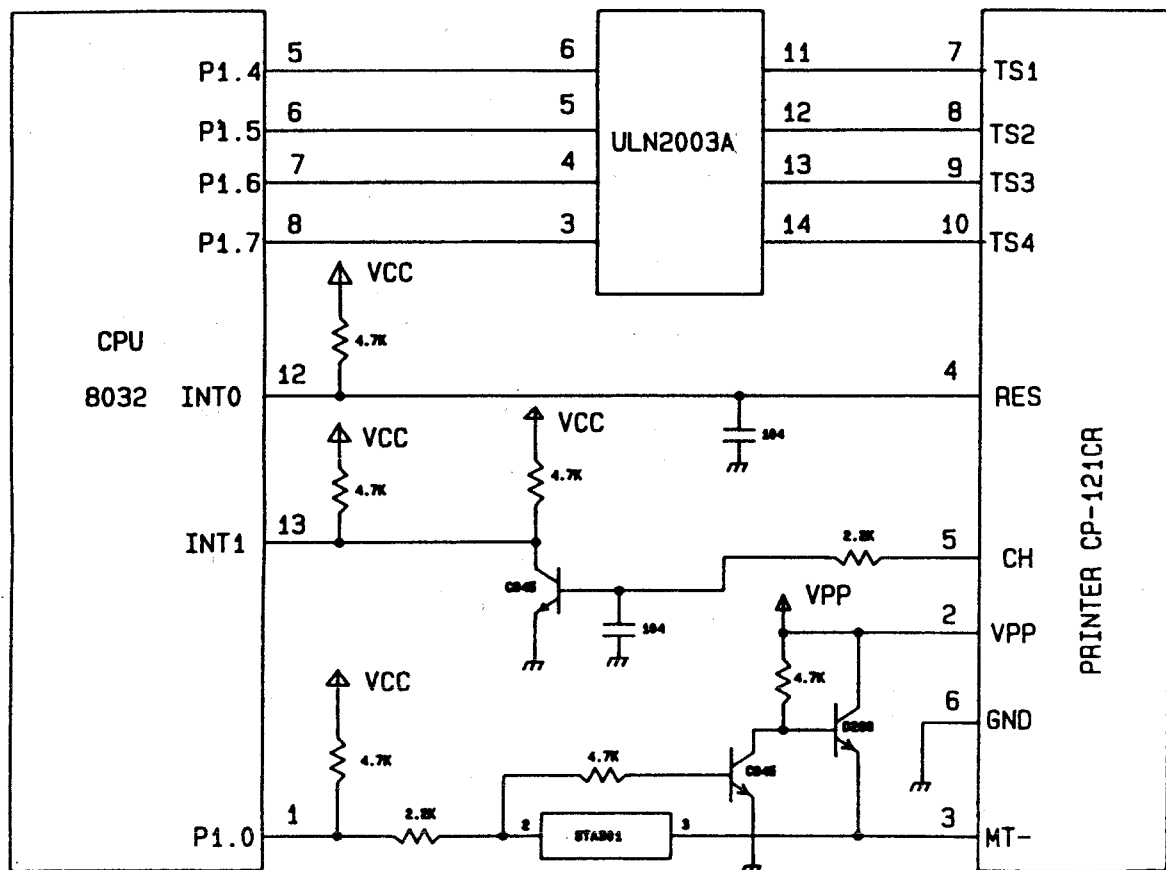
CPU directly accesses RP5C15 by the DATA bus therefore any desirable Time counters can be written to or read from the clock in the same way as writing to or reading from RAM as well as calendar, time counters and alarm function allowing battery back-up



4-9 PRINTER CIRCUIT

At the first, CPU drives DC motor through STA301, the timing signal CP and RP is generated from the printer to CPU for applying information of the any character position. The TR converts the analog timing signal to the digital signal.

When the signal of desirable position is detected, CPU activates the appropriate Hammer Solenoid through the ULN2003A, then meaningful information will be printed on the paper.

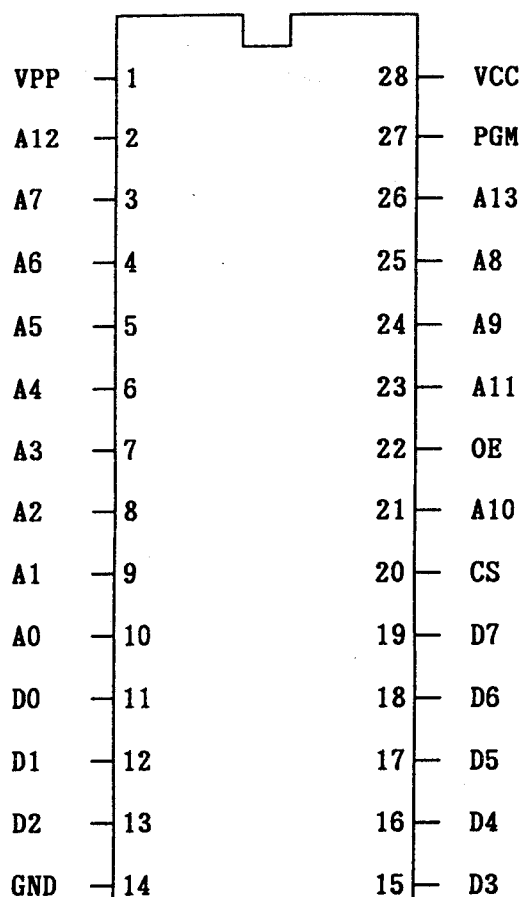


5. PART SPECIFICATION

8 0 3 2 C P U

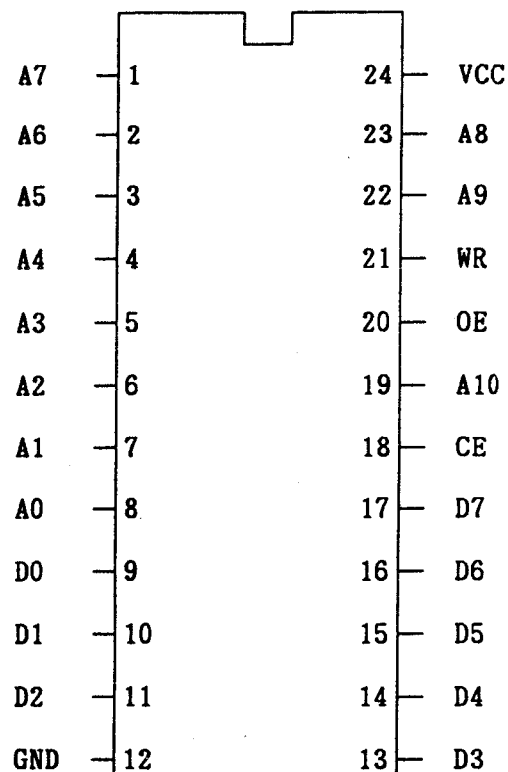
| USER | PORT | PIN | | PIN | PORT | USER |
|--------------|-------|-----|--|-----|----------|------|
| PRN MOTOR | P1.0 | 1 | | 40 | VCC | VCC |
| DRAWER | P1.1 | 2 | | 39 | P0.0 | AD0 |
| STAMP | P1.2 | 3 | | 38 | P0.1 | AD1 |
| SPOOL | P1.3 | 4 | | 37 | P0.2 | AD2 |
| TS1(PRINTER) | P1.4 | 5 | | 36 | P0.3 | AD3 |
| TS2(PRINTER) | P1.5 | 6 | | 35 | P0.4 | AD4 |
| TS3(PRINTER) | P1.6 | 7 | | 34 | P0.5 | AD5 |
| TS4(PRINTER) | P1.7 | 8 | | 33 | P0.6 | AD6 |
| RESET | RST | 9 | | 32 | P0.7 | AD7 |
| DIGIT 1 | P3.0 | 10 | | 31 | EA/VPP | GND |
| BUZZER | P3.1 | 11 | | 30 | ALE/PROG | ALE |
| RP(PRINTER) | P3.2 | 12 | | 29 | PSEN | PSEN |
| CP(PRINTER) | INT1 | 13 | | 28 | P2.7 | A15 |
| COMPULSORY | P3.4 | 14 | | 27 | P2.6 | A14 |
| BREAK(+18N) | P3.5 | 15 | | 26 | P2.5 | A13 |
| WRITE | WR | 16 | | 25 | P2.4 | A12 |
| READ | RD | 17 | | 24 | P2.3 | A11 |
| | XTAL1 | 18 | | 23 | P2.2 | A10 |
| | XTAL2 | 19 | | 22 | P2.1 | A9 |
| GND | VSS | 20 | | 21 | P2.0 | A8 |

E P R O M 2 7 1 2 8



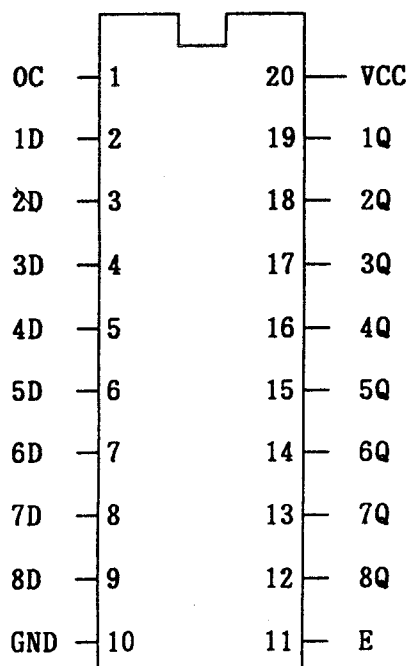
8 X 16KByte EPROM

R A M

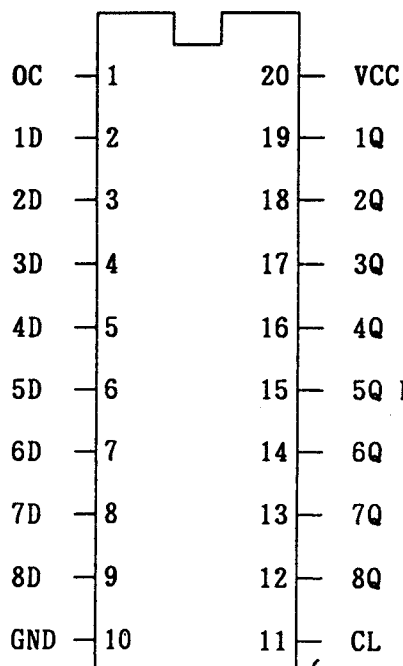


8 X 2KByte SRAM

L S 5 7 3



L S 5 7 4

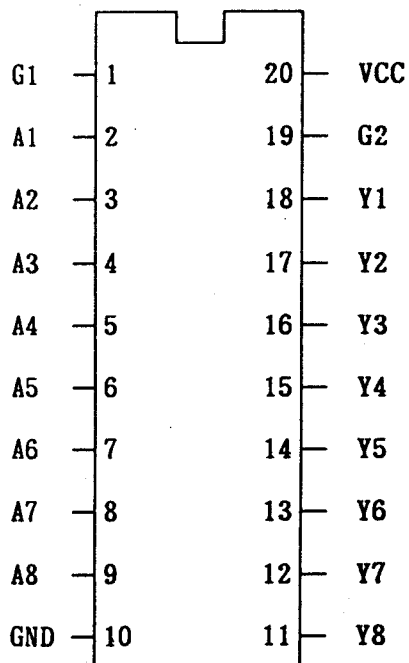


FUNCTION TABLE(LS573)

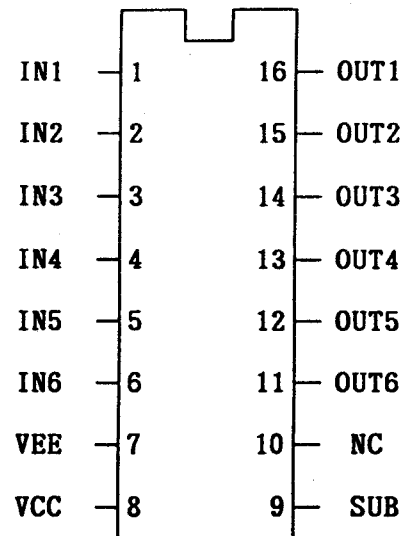
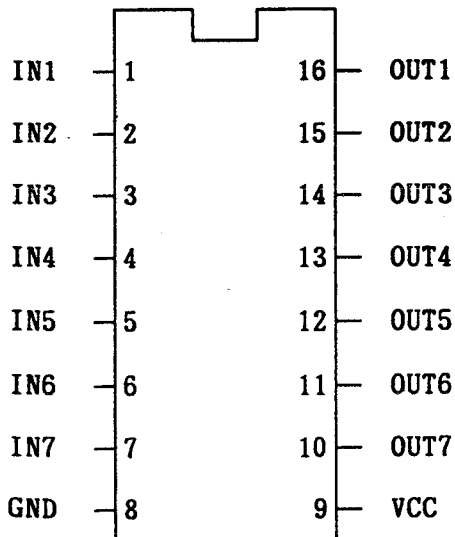
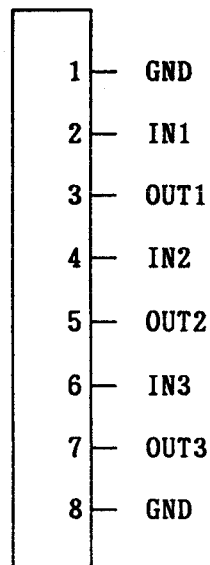
| OC | E | D | Q |
|----|---|---|----|
| L | H | H | H |
| L | H | L | L |
| L | L | X | Q. |
| H | X | X | Z |

5Q FUNCTION TABLE(LS574)

| OC | CLK | D | Q |
|----|-----|---|----|
| L | | H | H |
| L | | L | L |
| L | L | X | Q. |
| H | X | X | Z |

LS541**FUNCTION TABLE (LS541)**

| G1 | G2 | A | Y |
|----|----|---|---|
| L | L | L | L |
| L | L | H | H |
| H | X | X | Z |
| X | H | X | Z |

IR2C05**CURRENT DRIVER****ULN2003A****DARLINGTON TR-ARRAY****STA301****DARLINGTON TR-ARRAY**

947-390001BA

P A R T L I S T

(E R - 2 2 0 N)

1. ASSY LOWER CASE

| NO | CODE NO. | DESCRIPTION / SPECIFICATION | Q'TY | UNIT | REMARK |
|-----|--------------|--------------------------------|------|------|--------|
| A-2 | 813 390012AA | IMP,HOLDER CORD:SBHG1 T1.0 | 1 | EA | |
| | 813 390013AA | IMP,BRACKET-CASING:SBHG1.6 | 2 | EA | |
| | 813 390018AC | IMP,BRACKET-FOOT:SCP1 T1.6 | 2 | EA | |
| A-1 | 821 390058BA | PLT,HOLDER-PRINTER:ABS VO | 1 | EA | |
| | 821 390123AC | PLT,CASE-LOWER:ABS VO VH- | 1 | EA | |
| | 841 214022BA | MACHINE, SCREW, PH+, M4X10:N | 2 | EA | CU+CL |
| | 842 343022AB | TAPPING, PH+, 2, M3, L10:PH, + | 1 | EA | HC+CL |
| | 842 344022AB | TAPPING, PH+, 2, M4, L10:PH, + | 2 | EA | CL+BC |
| | 842 345027AB | TAPPING, PH+, 2, M5, L14:PH, + | 2 | EA | DR+CL |
| | 842 444013AB | TAPPING, RH+, 2S, M4, L8:RH, + | 2 | EA | CL+B.F |
| | 842 840007BG | TAPPING, PH+, W, 2S, M3, L10:P | 2 | EA | CL+HP |
| | 842 840009AA | TAPPING, PH+, W, 2S, M3, L8:PH | 1 | EA | CL+HW |
| | 855 133001BB | WASHER, TOOTHED ET, M3:M3, I | 1 | EA | |

2. ASSY POWER SUPPLY

| NO | CODE NO. | DESCRIPTION / SPECIFICATION | Q'TY | UNIT | REMARK |
|----------------|----------------|--|------|------|-------------|
| (POWER-CORD) | | | | | |
| B-11 | 955 001380AAAA | CBF-POWER CORD, 1600MM:LP-33 HOVV-F 0.75 | 1 | EA | (EUROPE) |
| B-11 | 955 001382AAAA | CBF-POWER CORD, 1600MM:KP-550 LTSA-3 | 1 | EA | (AUSTRALIA) |
| B-11 | 955 001384AAAA | CBF-POWER CORD, 1600MM:HS-3 SVT | 1 | EA | (USA) |
| B-11 | 955 001385AAAA | CBF-POWER CORD, 1600MM:GTES-3 HOVV-F | 1 | EA | (NON-PLUG) |
| B-11 | 955 001416AAAA | CBF-POWER CORD, 1600MM:GB13A4 HOVV-F | 1 | EA | (U.K) |
| (POWER-TRANS) | | | | | |
| B-2 | 923 390001AA | TRANS-POWER, 220V/50HZ | 1 | EA | (EUROPE) |
| B-2 | 923 390001BA | TRANS-POWER, 240V/50HZ | 1 | EA | (U.K) |
| B-2 | 923 390001CA | TRANS-POWER, 120V/60HZ | 1 | EA | (USA) |
| B-2 | 923 390001DA | TRANS-POWER, 110, 220V/60HZ | 1 | EA | (KOREA) |
| B-4 | 842 344022AB | TAPPING, PH+, 2, M4, L10:PH, + | 1 | EA | |
| B-3,5 | 855 124001BB | WASHER, SPRING, M4:M4, ID4.1 | 1 | EA | |
| (GROUND-PLATE) | | | | | |
| B-1 | 813 390049AA | IMP, PLATE-GROUND:SBHG1 T1.0 | 1 | EA | |
| | 842 443008AB | TAPPING, RH+, 2, M3, L6:RH, +, | 1 | EA | |
| | 847 501009DA | SPECIAL, TAPTITE, PH+, M4*6 | 1 | EA | |
| | 855 124001BB | WASHER, SPRING, M4:M4, ID4.1 | 1 | EA | |
| | 855 133001BB | WASHER, TOOTHED ET, M3:M3, I | 1 | EA | |
| | 955 390043AAAA | CBF-TERMINAL LUG, 90MM | 1 | EA | |

3. ASSY HOLDER MOTOR

| NO | CODE NO. | DESCRIPTION / SPECIFICATION | Q'TY | UNIT | REMARK |
|-----|--------------|--------------------------------|------|------|--------|
| C-3 | 813 390044AA | IMP,HOLDER MOTOR:SBHG1 T1 | 1 | EA | |
| C-2 | 821 390034AA | PLT,PULLY-WINDING A:ABS | 1 | EA | |
| C-1 | 821 390044AB | PLT,HOLDER-WINDING:ABS VO | 1 | EA | |
| C-7 | 821 397011AA | PLT,ROLLER-MOTOR:URETANE | 1 | EA | |
| C-8 | 841 312603BB | MACHINE, SCREW, PH+, M2.6:NO | 2 | EA | HM+M |
| | 842 443022AB | TAPPING, RH+, 2, M3, L10:RH, + | 1 | EA | HM+HW |
| | 855 114002AB | WASHER, PLAIN, M4:M4, ID4.3, | 2 | EA | |
| C-9 | 855 122601BB | WASHER, SPRING, M2.6:M2.6, I | 2 | EA | HM+M |
| C-4 | 953 280032AA | MEP, MOTOR: | 1 | EA | |

4. ASSY PRINTER

| NO | CODE NO. | DESCRIPTION / SPECIFICATION | Q'TY | UNIT | REMARK |
|-----|----------------|-----------------------------|------|------|--------|
| D-1 | 353 033104AAAA | DIGITAL PRINTER:CP-121CR | 1 | EA | PR+G |
| D-3 | 825 119334BA | INC,LABEL, SERIAL | 1 | EA | |
| D-5 | 842 443013AB | TAPPING, RH+, 2, M3, L8 | 4 | EA | |
| D-4 | 842 840007BC | TAPPING, PH+, W, 2S, M3, L6 | 1 | EA | |
| D-6 | 855 134001BB | WASHER, TOOTHED, M4, ET | 1 | EA | |
| D-8 | 855 170065NC | WASHER, PLAIN | 4 | EA | |
| | 937 120068AA | MAG-CORE, FERRITE, TOROIDA | 1 | EA | |
| | 955 390004AZAA | CBF-TERMINAL RING, 260MM | 1 | EA | |

5. ASSY HOLDER STAMP

| NO | CODE NO. | DESCRIPTION / SPECIFICATION | Q'TY | 단위 | REMARK |
|------|----------------|---------------------------------------|------|----|------------------------------------|
| E | | (ASSY STAMP) | | | |
| E-2 | 813 390030AA | IMP, ARM STAMP:SBC-1 T1.6 | 1 | EA | (ENGLISH) (SPANISH) (GERMAN) |
| E-5 | 813 390042AA | IMP, HOLDER STAMP:SBC-1 T1.0 | 1 | EA | |
| E-4 | 813 390060AA | IMP, SPRING PLATE:SUS 304 | 1 | EA | |
| E-10 | 821 390047AA | PLT, CASE STAMP:ABS BLK | 1 | EA | |
| E-3 | 821 390048AA | PLT, CASE HOLDER:ABS BLK | 1 | EA | |
| E-6 | 821 397006AA | PLT, RUBBER STAMP:POROUS RUBBER"C" | 1 | EA | |
| E-6 | 821 397006AB | PLT, RUBBER STAMP:POROUS RUBBER"C" | 1 | EA | |
| E-6 | 821 397006AD | PLT, RUBBER STAMP:POROUS RUBBER"C" | 1 | EA | |
| E-7 | 831 521032AA | COM SPRING STAMP:SUS WH P10.4 | 1 | EA | |
| E-9 | 857 140070AE | MISCEL, SPRING PIN, D3, L12 | 1 | EA | |
| E-8 | 857 150008AG | MISCEL, E-RING, #3 | 2 | EA | |
| E-1 | 925 380008AA | COIL MAGNETIC SOLENOID:DC 17V | 1 | EA | |
| E-14 | 353 033124AAAA | (ASSY STAMP UNIT) | 1 | EA | |
| E-14 | 813 390114AA | IMP, BRIDGE STAMP:SBC1 T1.0 | 1 | EA | |
| E-14 | 813 390115AA | IMP, BRACKET STAMP:SBC1 T1.0 | 1 | EA | |
| E-15 | 821 390138AA | PLT, SHAFT PUSH:NYLON+GLASS FIBER 30% | 1 | EA | |
| E-11 | 841 213008BB | MACHINE SCREW, FH+, M3*6 | 2 | EA | |
| E-12 | 841 810005AE | MACHINE SCREW, PH+, W | 2 | EA | |
| E-13 | 855 133001BB | WASHER, TOOTHED ET, M3 | 1 | EA | |

6. ASSY KEY BOARD

| NO | CODE NO. | DESCRIPTION / SPECIFICATION | Q'TY | 단위 | REMARK |
|-------|---------------|------------------------------|------|----|----------|
| G | 23553-701-710 | (ASSY KEY BOARD:MEMBRANE) | 1 | EA | (BR-220) |
| G | 23553-701-720 | (ASSY KEY BOARD:MEMBRANE) | 1 | EA | |
| G | 23553-701-760 | (ASSY KEY BOARD:MEMBRANE) | 1 | EA | |
| G-1 | 23554-700-210 | SWITCH-KEY TOP 1:ABS | | EA | |
| G-1 | 23554-700-310 | SWITCH-KEY TOP 2:ABS | | EA | |
| G-1 | 23554-700-410 | SWITCH-KEY TOP 3:ABS | | EA | |
| G-1 | 23554-700-510 | SWITCH-KEY TOP 4:ABS | | EA | |
| G-1 | 23554-700-610 | SWITCH-KEY TOP 6:ABS | | EA | |
| G-1 | 23554-700-710 | SWITCH-KEY TOP 7:ABS | | EA | |
| G-1 | 23554-700-810 | SWITCH-KEY TOP 8:ABS | | EA | |
| G-1 | 23554-700-910 | SWITCH-KEY TOP 9:ABS | | EA | (BR-240) |
| G-1 | 23554-701-010 | SWITCH-KEY TOP 00:ABS | | EA | |
| G-1 | 23554-701-310 | SWITCH-KEY TOP 5:ABS | | EA | |
| G-2 | 23554-701-410 | SWITCH-KEY TOP 0:ABS | | EA | |
| G-3 | 23559-700-210 | KEY-HOUSING:POM | | EA | |
| G-11 | 26402-700-710 | PLATE-MOUNT:SECC T1.2 | | EA | |
| | 26403-700-410 | (ASSY FPC) | | EA | |
| | 26402-702-010 | FPC (A):PET T=125U | 1 | EA | |
| | 26402-702-110 | FPC (B):PET T=125U | 1 | EA | |
| | 813 390097AA | IMP, BASE PLATE:SECC T1.0 | 1 | EA | |
| | 26403-701-510 | SHIFT-PIN:SPCC SD | | EA | (BR-808) |
| G-4 | 26674-710-610 | COIL SPRING:SWPA RETURN 1*1U | | EA | |
| G-12 | 26674-710-710 | COIL SPRING:SWPA RETURN 1*2U | | EA | |
| | 26674-710-810 | COIL SPRING:SUS CONTACT | | EA | |
| | 27148-530-060 | SCREW-TP:M2.3*6 | | EA | |
| G-5 | 27623-701-310 | KEY-TOP S | | EA | |
| G-8 | 27623-701-410 | KEY-TOP L | | EA | |
| G-7 | 27624-702-110 | KEY-CAP S | | EA | |
| G-10 | 27624-702-210 | KEY-CAP L | | EA | |
| G-6,9 | 28131-701-910 | LABEL KEY-TOP SET | | EA | |

7. ASSY UPPER

| NO | CODE NO. | DESCRIPTION / SPECIFICATION | Q'TY | 단위 | REMARK |
|------|----------------|----------------------------------|------|----|----------------------------------|
| H-2 | 821 390108AB | PLT, WINDOW:PC (LEXAN 141-71016) | 1 | EA | (ER-220) (ER-240) (ER-808) |
| H-1 | 821 390136AC | PLT, CASE UPPER:ABS(V0) | 1 | EA | |
| | 821 397004AA | PLT, PAD GROUND:NR ER-200 | 1 | EA | |
| | 825 119359BA | INC, LABEL BATTERY NEXT:AR | 1 | EA | |
| H-10 | 825 139375JA | INC, PLATE-MODE S/W:PVC TO.3 | 1 | EA | |
| H-10 | 825 139375JB | INC, PLATE-MODE S/W:PVC TO.3 | 1 | EA | |
| H-10 | 825 139375JD | INC, PLATE-MODE S/W:PVC TO.3 | 1 | EA | |
| H-9 | 841 810005AE | MACHINE, SCREW, PH+, W | 2 | EA | |
| H-6 | 842 343013AB | TAPPING, PH+, 2, M3, L8 | 2 | EA | |
| | 842 840007BG | TAPPING, PH+, W, 2S, M3, L10 | 1 | EA | |
| H-8 | 933 230034KA | SWITCH-KEY LOCK, KEY-A:OP | 1 | EA | |
| H-8 | 933 230034KB | SWITCH-KEY LOCK, KEY-B:VD | 1 | EA | |
| H-8 | 933 230034KC | SWITCH-KEY LOCK, KEY-C:P | 1 | EA | |
| | 353 033154AAAA | ASSY KEY LOCK & R/J SWITCH | 1 | EA | |
| H-3 | 813 390048AA | IMP, BRACKET-RESET S/W | 1 | EA | |
| H-13 | 831 323001AG | COM, TUBE HISHI:D4=0.25 BLK | 0.02 | MT | |
| H-5 | 841 312603BB | MACHINE, SCREW, PH+, M2.6 | 2 | EA | |
| H-7 | 933 230034AA | SWITCH ROTATRY, 10 | 1 | EA | |
| H-4 | 933 290070TA | SWITCH-SLIDE, TOP, DPDT | 1 | EA | |
| | 955 390017AZAA | CBF-CONN ASSY, 310MM, 9P | 1 | EA | |

8. ASSY DISPLAY

| NO | CODE NO. | DESCRIPTION / SPECIFICATION | Q'TY | UNIT | REMARK |
|-----|----------------|-----------------------------|------|------|--------|
| I-1 | 821 390017AA | PLT, HOLDER PWB DISPLAY:AB | 1 | EA | |
| I-3 | 821 397022AA | PLT, PAD-DIGITRON:RUBBER S | 2 | EA | |
| I-4 | 895 449005AA | DISPLAY-LCD, 9DIGT | 1 | EA | |
| | 935 240109KC | CON-BOX HEADER, 9P, 2.5MM | 1 | EA | |
| | 935 240110KC | CON-BOX HEADER, 10P, 2.5MM | 1 | EA | |
| I-2 | 947 390001AA | PCB-DISPLAY, ER-220N, FR-1 | 1 | EA | |
| | 955 390001AAAA | CBF-CONN ASSY, 310MM, 9P | 1 | EA | |
| | 955 390001AAAB | CBF-CONN ASSY, 310MM, 10P | 1 | EA | |

9. ASSY TURRET DISPLAY

| NO | CODE NO. | DESCRIPTION / SPECIFICATION | Q'TY | UNIT | REMARK |
|-----|----------------|-----------------------------|------|------|--------|
| J-2 | 23024-705-510 | PWB-TURRET DISPLAY:FR-1 | 1 | EA | |
| J-1 | 821 390043AF | PLT, TURRET-BODY:ABS V0 VH | 1 | EA | |
| J-6 | 821 390132AD | PLT, WINDOW-TURRET:PC(LEXA | 2 | EA | |
| J-3 | 821 397022AB | PLT, PAD-DIGITRON:RUBBER S | 2 | EA | |
| J-5 | 827 159038AA | PAC, PAD TURRET PCB:RUBBER | 1 | EA | |
| J-4 | 895 449005AA | DISPLAY-LCD, 9DIGT | 1 | EA | |
| | 955 390012AZAA | CBF-CONN ASSY, 310MM, 9P | 1 | EA | |
| | 955 390017AZAA | CBF-CONN ASSY, 310MM, 10P | 1 | EA | |

10. ASSY-COVER PRINTER

| NO | CODE NO. | DESCRIPTION / SPECIFICATION | Q'TY | UNIT | REMARK |
|-----|--------------|-----------------------------|------|------|--------|
| K-2 | 821 390020AA | PLT, WINDOW C/P: ACRYL | 1 | EA | |
| K-1 | 821 390122AB | PLT, COVER-PRINTER: ABS VO | 1 | EA | |
| K-3 | 825 139173MA | INC, BRAND PANEL: PVC TO.3 | 1 | EA | |

11. DRAWER

A. ASSY-BILL COIN

| NO | CODE NO. | DESCRIPTION / SPECIFICATION | Q'TY | UNIT | REMARK |
|----|---------------|-------------------------------------|------|------|--------------|
| | 2D902-701-077 | ASSY-BILL COIN | 1 | EA | (A5C4B) |
| | 2D902-701-076 | ASSY-BILL COIN | 1 | EA | (A5C5B) |
| | 2D902-701-079 | ASSY-BILL COIN | 1 | EA | (A8C4B) |
| | 821 390002AA | PLT, LEVER PRESS: ACETAL, BL | 4,5 | EA | |
| | 831 521006AA | COM, SPRING-LEVER PRESS: SU | 4,5 | EA | |
| | 813 390014AA | IMP, HOLDER-LEVER PRESS: SUS-WH | 1 | EA | |
| | 841 613008BB | MXCHINE, SCREW, BH+, M3X6: NO | 3 | EA | |
| | 842 343008AB | TAPPING, PH+, 2, M3, L6: PH. +, | 1 | EA | |
| | 813 390002AA | IMP, HOLDER LEVER PRESS: ACETAL, BL | 4,5 | EA | |
| | 821 390005AA | PLT, PARTITION-BILL: STAREX | 4 | EA | |
| | 821 390003AA | PLT, BILL COIN-TILL: STAREX | 1 | EA | (5C5B, 5C4B) |
| | 821 390049AA | PLT, BILL COIN-TILL: ABS(BLK) | 1 | EA | (5C5B, 5C4B) |

B. ASSY-TRAY

| NO | CODE NO. | DESCRIPTION / SPECIFICATION | Q'TY | UNIT | REMARK |
|------|---------------|----------------------------------|------|------|--------------------|
| | 2D902-701-052 | ASSY-TRAY | 1 | EA | |
| | 831 561002AB | LOCK, WEY ASSY | 1 | EA | (LOCK KEY: NO) |
| | 813 390036AB | IMP, PANEL-FRONT: SBC1 T1.0 | 1 | EA | (LOCK KEY: YES) |
| | 2D903-701-076 | ASSY SUB TRAY | 1 | EA | (BRD-A5502, A8402) |
| D-6 | 813 390025AA | IMP, SUPPORT-TRAY BRACKET: | 1 | EA | |
| | 813 390034AA | IMP, TRAY-TILL: SBHG-1 T1.2 | 1 | EA | |
| | 813 390053AA | IMP, BRACKET-SHAFT LOCK: SB | 1 | EA | |
| | 813 390055AA | IMP, SUPPORT-TRAY: SBHG-1 T | 1 | EA | |
| D-10 | 813 390056AA | IMP, SUPPORT-PANEL LH: SBHG | 1 | EA | |
| | 813 390057AA | IMP, SUPPORT-PANEL RH: SBHG | 1 | EA | |
| | 853 126001BB | NUT, HEX, 2-M6: HEX, 2, M6, -, Z | 1 | EA | |
| | 821 390062AA | PLT, SPONGE-TENSION: SPONGE | 2 | EA | |
| D-11 | 813 390096AA | IMP, ROLLER: DR-19-B1 PI19 | 2 | EA | |
| | 27308-203-001 | PLAIN WASHER | 2 | EA | |
| | 813 390025AA | IMP, SUPPORT-TRAY BRACKET: | 1 | EA | |
| D-9 | 841 514013BB | MACHINE SCREW, TH+, M4*8 | 2 | EA | |
| | 813 395000AA | IMP, SHAFT-LOCK: S45C PI5.0 | 1 | EA | |
| D-12 | 841 213008BC | MACHINE, SCREW, FH+, M3X6: NO | 1 | EA | |
| | 857 150008AG | MISCEL, E RING, #3: ID3, OD7, | 1 | EA | |

C. ASSY-HOUSING

| NO | CODE NO. | DESCRIPTION / SPECIFICATION | Q'TY | UNIT | REMARK |
|-----|---------------|-----------------------------|------|------|--------|
| A-2 | 2D903-701-051 | ASSY-SUB HOUSING | 1 | EA | |
| | 813 390007AA | IMP, HOUSING: SBC-1 T1.0 DR | 1 | EA | |
| | 813 390031AA | IMP, CHANNEL-LH: SBC-1 T1.6 | 1 | EA | |
| | 813 390032AA | IMP, CHANNEL-RH: SBC-1 T1.6 | 1 | EA | |
| | 813 390037AA | IMP, FRONT-PLATE: SBC-1 T1. | 1 | EA | |
| | 813 390038AA | IMP, REAR-PLATE: SBC-1 T1.0 | 1 | EA | |
| | 813 390058AA | IMP, SUPPORT-CHANNEL: SBC-1 | 1 | EA | |
| | 813 390096AA | IMP, ROLLER: DR-19-B1 PI19 | 1 | EA | |
| A-1 | | | | | |

D. ASSY-LOCK

| NO | CODE NO. | DESCRIPTION / SPECIFICATION | Q'TY | UNIT | REMARK |
|-----|---------------|--|------|------|----------|
| C | 2D903-701-005 | ASSY-LOCK | 1 | EA | (U.S.A) |
| C | 2D903-701-004 | ASSY-LOCK | 1 | EA | (EUROPE) |
| | 841 314029BB | MACHINE, SCREW, PH+, M3X16:NO | 1 | EA | |
| | 831 313007AA | COM, RUBBER BUMPER:NR BL(E | 0 | EA | |
| C-4 | 831 522004AA | COM, SPRING-PUSH:FZN BLK | 1 | EA | |
| C-3 | 831 521005AA | COM, SPRING-LOCK LEVER:SIL | 1 | EA | |
| | 811 390003AA | SUA, BRACKET-LOCK ASS'Y:SB | 1 | EA | |
| | 813 390029AA | IMP, LEVER-LOCK:SCP1 T2.3 | 1 | EA | |
| | 857 110034AA | MISCEL, RIVET, SPECIAL:D4, L | 1 | EA | |
| | 937 330003AA | MAG-SOLENOID ASSY:ERD 550C | 1 | EA | (U.S.A) |
| C-1 | 24793-700-101 | DC-SOLENOID ASSY:KSD-2013 | 1 | EA | (EUROPE) |
| | 935 810916AA | CON-TERMINAL, PLUG, PIN | 3 | EA | |
| | 813 390017AA | IMP, BRACKET M/SW:SBHG T1.0 | 0 | EA | |
| C-6 | 841 413008BB | MACHINE, SCREW, RH+, M3X6:NO | 1 | EA | |
| | 933 250034AA | SWITCH-MICRO, SIM LEVER | 1 | EA | |
| C-7 | 841 514028BA | MACHINE, SCREW, TH+, M4X15:N | 2 | EA | |
| | 853 123001BB | NUT, HEX 2-M3:HEX, 2, M3, -, ZPC3, SM20C | 2 | EA | |
| | 841 514013BB | MACHINE, SCREW, TH+, M4*8 | 3 | EA | |
| | 821 397005AA | PLT, RUBBER-STOPPER:NR BL(| 1 | EA | |
| | 813 390035AA | IMP, BOTTOM-PLATE:SBHG-1 T | 1 | EA | |
| | 821 391001AA | PLT, LEVER ASSY:DRAWER | 0 | EA | |

E. ASSY-BOTTOM

| NO | CODE NO. | DESCRIPTION / SPECIFICATION | Q'TY | UNIT | REMARK |
|-----|--------------|------------------------------|------|------|--------|
| B-1 | 813 390035AA | IMP, BOTTOM-PLATE:SBHG-1 T | 1 | EA | |
| | 821 397005AA | PLT, RUBBER-STOPPER:NR BL(| 2 | EA | |
| | 831 313006AA | COM, RUBBER FOOT | 4 | EA | |
| | 841 514028BA | MACHINE, SCREW, TH+, M4X15:N | 4 | EA | |

12. ASSY-MAIN PCB

A. ASSY-MAIN AUTO

| NO | CODE NO. | DESCRIPTION / SPECIFICATION | Q'TY | UNIT | REMARK |
|----|----------------|-----------------------------|------|------|------------------------|
| | 353 033064AAAA | ASSY MAIN AUTO:ER-220 | | | |
| | 02169-201-077 | DIODE:1N4003(T) | 7 | EA | D1,2,3,4,5,6,20 |
| | 873 790032AANB | IC-MOS,74HCT32,GATE | 1 | EA | IC12 |
| | 873 790541AC | IC-MOS,74HCT541,BUFFER:DI | 1 | EA | IC4 |
| | 873 790573AC | IC-MOS,74HCT573,LATCH:DIP | 1 | EA | IC6 |
| | 873 790574AC | IC-MOS,74HCT574,LATCH:DIP | 2 | EA | IC7,8 |
| | 881 700515AA | IC-LIN,5C15,TIME CLOCK:DI | 1 | EA | IC5 |
| | 881 800205AA | IC-LIN,2C05,TR ARRAY:DIP, | 3 | EA | IC9,10,11 |
| | 881 802003AAND | IC-LIN,2657 | 1 | EA | IC13 |
| | 887 135472SCSA | IC-HYB,R-NETWORK,9P:SIP,9 | 3 | EA | RA4,5,6 |
| | 891 190733XC | TR-PNP,KSC733,TO-92 | 1 | EA | TR1 |
| | 891 390006XA | TR-NPN,KSC945,TO-92:0.25W | 6 | EA | TR2,4,6,7,8,9 |
| | 891 490288BCNA | (S)TR-NPN,KSD288-Y,TO-92 | 1 | EA | TR,5 |
| | 893 114148AANA | DIODE-SIG,1N4148,DO-35:75 | 13 | EA | D7-19 |
| | 911 131007DA | REF-CF,100,5%,1/4W:250V,- | 1 | EA | R27 |
| | 911 131507DA | REF-CF,150,5%,1/4W:250V,- | 3 | EA | R18,21,29 |
| | 911 132207DA | REF-CF,220,5%,1/4W:250V,- | 1 | EA | R17 |
| | 911 134707DA | REF-CF,470,5%,1/4W:250V,- | 1 | EA | R20 |
| | 911 135607DA | REF-CF,560,5%,1/4W:250V,- | 1 | EA | R2 |
| | 911 136807DA | REF-CF,680,5%,1/4W:250V,- | 2 | EA | R1,3 |
| | 911 141007DA | REF-CF,1K,5%,1/4W:250V,-3 | 1 | EA | R23 |
| | 911 142207DA | REF-CF,2.2K,5%,1/4W:250V, | 4 | EA | R13,14,15,19 |
| | 911 144707DA | REF-CF,4.7K,5%,1/4W:250V, | 9 | EA | R6,7,11,12,22-28 |
| | 911 151007DA | REF-CF,10K,5%,1/4W:250V,- | 1 | EA | R8 |
| | 911 161007DA | REF-CF,100K,5%,1/4W:250V, | 1 | EA | R4 |
| | 915 312300HJHH | CAP-CERAMIC,300J,1H,SL:30 | 4 | EA | CC7,8,11,12 |
| | 915 325100HKPH | CAP-CERAMIC,103K,1H,Y5P:1 | 2 | EA | CC14,15 |
| | 915 336100HZVH | CAP-CERAMIC,104Z,1H,Y5V:1 | 12 | EA | CC1-6,9,10,13,16,17,18 |
| | 917 121470HM | CAP-AL. ELEC,475M,1H:(T)50 | 1 | EA | CE8 |
| | 917 122470CM | CAP-AL. ELEC,476M,1C:(T)50 | 1 | EA | CE3 |
| | 917 123100CM | CAP-AL. ELEC,107M,1C:(T)16 | 3 | EA | CE7,10,11 |
| | 935 240104KCSA | CON-BOX HEADER,4P,2.5MM | 1 | EA | CN4 |
| | 937 120204BA | MAG-CORE,FERRITE,BEAD | 3 | EA | FB1,4 |
| | 937 120208AA | MAG-CORE,FERRITE,BEAD | 3 | EA | FB2,3 |
| | 947 390001BA | PCB-MAIN,ER-220N,FR-1 | 1 | EA | |
| | 955 005001AAAB | CBF-JUMPER WIRE,52MM:TAPP | 61 | EA | |

B.MAIN PCB

| NO | CODE NO. | DESCRIPTION / SPECIFICATION | Q'TY | UNIT | REMARK |
|----|------------------|--------------------------------|------|------|----------------------|
| | 24719-006-010 | BATTERY-NICAD | 1 | EA | |
| | (353 033154AABB) | (ASSY HEAT SINK:45+D288) | 1 | EA | TR 288 |
| | 831 511011AB | COM,HEAT SINK:AG063 H45 | 1 | EA | |
| | 842 840009AA | TAPPING, PH+, W, 2S, M3, L8:PH | 1 | EA | |
| | 891 490288BCNA | (S)TR-NPN, KSD288-Y, TO-92 | 1 | EA | |
| | (353 033154AABD) | (ASSY HEAT SINK:45 + 7805) | 1 | EA | 7805 |
| | 831 511011AA | COM,HEAT SINK:AG063 H45 | 1 | EA | |
| | 842 840009AA | TAPPING, PH+, W, 2S, M3, L8:PH | 1 | EA | |
| | 881 307805KANE | IC-LIN, 7805, REGULATOR:TO- | 1 | EA | |
| | 825 119334BA | INC, LABEL SERIAL | 1 | EA | |
| | 825 119491AA | INC, ROM PROTECTOR | 1 | EA | |
| | 842 443013AB | TAPPING, RH+, 2, M3, L8 | 1 | EA | PWB+CL |
| | 853 123001BB | NUT, HEX, 2-M3 | 2 | EA | TR+HS |
| | 877 108032AA | IC-MPU, 8032, PROCESSOR:DIP | 1 | EA | IC1 |
| | 881 800301UA | IC-LIN, 301, TR ARRAY:SIP, 8 | 1 | EA | |
| | 883 106116AANB | IC-MEM, SRAM, 6116, 2K*8 | 1 | EA | IC3 |
| | 883 627256BA | IC-MEM, EPROM, 27C256, 256K: | 1 | EA | IC2 |
| | 887 135104SE | IC-HYB, R-NETWORK, 7P | 3 | EA | RA1, 2, 3 |
| | 887 200012SA | IC-HYB, C-NETWORK, 9P | 1 | EA | CA2 |
| | 893 290019CA | DIODE-ZEN, DZ-18B, DO-35 | 1 | EA | DZ3 |
| | 893 290031FB | DIODE-ZEN, UZ-5. 1B | 1 | EA | DZ2 |
| | 893 290032AC | DIODE-ZEN, UZP-24B, DO-41: | 1 | EA | DZ1 |
| | 893 290032AF | DIODE-ZEN, UZP-6. 2B, DO-41: | 1 | EA | DZ4 |
| | 893 390108AANA | DIODE-REC, W02G, :200V, 1A, 1 | 1 | EA | B. D1 |
| | 893 399062AA | DIODE-REC, FM202, -:200V, - | 1 | EA | B. D2 |
| | 911 151007DA | REF-CF, 10K, 5%, 1/4W:250V, - | 1 | EA | SOLDER AREA |
| | 911 328207JA | REF-MO, 82, 5%, 2W(S):500V, | 1 | EA | R16 |
| | 911 331507JF | REF-MO, 150, 5%, 2W(S):500V, | 1 | EA | R9 |
| | 911 337507GB | REF-MO, 750, 5%, 2W(S):500V, | 1 | EA | R10 |
| | 911 441007GA | REF-MF, 1K, 5%, 1W | 1 | EA | R5 |
| | 917 123100LM | CAP-AL. ELEC, 107M, 2A:(T)10 | 1 | EA | CE1 |
| | 917 124220FM | CAP-AL. ELEC, 228M, 1V | 1 | EA | CE5 |
| | 917 843470CM | CAP-AL, ELEC, 477M, 1C:470UF | 2 | EA | CE2, 6 |
| | 917 844220HM | CAP-AL, ELEC, 228M, 1H, 18X | 1 | EA | CE4 |
| | 935 144106AANB | CON-FLAT CABLE, 6P, 2.54:ST | 1 | EA | CN8 |
| | 935 144108AANA | CON-FLAT CABLE, 8P, 2.54:ST | 1 | EA | CN7 |
| | 935 155128DC | CON-IC SOCKET, 28P:DIP, STR | 1 | EA | |
| | 935 220110TF | CON-NOWALL HEADER, 10P | 1 | EA | CN5 |
| | 935 240108DA | CON-BOX HEADER, 8P, 2.5MM:1 | 1 | EA | CN1 |
| | 935 240109DA | CON-BOX HEADER, 9P, 2.5MM:1 | 2 | EA | CN3, 9 |
| | 935 240110DA | CON-BOX HEADER, 10P, 2.5MM:1 | 1 | EA | CN2 |
| | 939 010031AA | AUDIO-BUZZER:-, -, -, - | 1 | EA | |
| | 941 110067UBNA | CRYSTAL, 12M, 50:HC-18/U, - | 1 | EA | |
| | 941 110073AA | CRYSTAL, 32.768K, 20:DT-38, | 1 | EA | |
| | 949 115003FHNB | FUSE-GLASS TUBE, 1, 250:QUI | 1 | EA | 1A(EUROPE) |
| | 949 115009THNB | FUSE-GLASS TUBE, 2A, 250V:T | 1 | EA | 2A(EUROPE) |
| | 949 115101NLNA | FUSE-GLASS TUBE, 1, 125:QUI | 1 | EA | 1A(U.S. A) |
| | 949 115101SLNA | FUSE-GLASS TUBE, 2A, 125V:T | 1 | EA | 2A(U.S. A) |
| | 953 260017BA | FUSE CLIP, 5*20 | 4 | EA | |
| | 955 390003AZAA | CBF-CONN ASSY, 100MM, 3P | 1 | EA | (DRAWER CONN EUROPE) |
| | 955 390046AAAA | CBF-CONN ASSY, 100MM, 3P | 1 | EA | (DRAWER CONN USA) |
| | 955 390003AZAB | CBF-CONN ASSY, 100MM | 1 | EA | (COMPULSORY) |

